

AMENDED PATENT CLAIMS

1. Catalyst support body (1) having a surface (2) on which a coating (3),
5 bonded to the surface, is provided, wherein the coating (3) has fissures (4) having a length (5), those lengths exhibiting a total fissure length of at least 500 m/m^2 [meters per square meter] and the coating (3) having an adhesive tensile strength of at least 500 N/m^2 [Newtons per square meter].
- 10 2. Catalyst support body (1) according to claim 1, the coating (3) having a layer thickness (6) of at least 0.02 mm [millimeters].
3. Catalyst support body (1) according to claim 1 or 2, the coating (3) having
15 fissures (4) having a length (5), the total fissure length being at least 1000 m/m^2 [meters per square meter].
4. Catalyst support body (1) according to any one of the preceding claims,
wherein the catalyst support body has a first thermal expansion coefficient and the
coating (3) has a second thermal expansion coefficient, the two thermal expansion
20 coefficients differing, at least at a temperature in the range of from 20°C to 650°C , by at least 10 %.
5. Catalyst support body (1) according to any one of the preceding claims,
wherein the coating (3) is a catalytically active coating (3) for partial oxidation of
25 propene and acrolein.

6. Catalyst support body (1) according to any one of the preceding claims, wherein the coating (3) comprises at least one inert constituent (7).

7. Catalyst support body (1) according to any one of the preceding claims, wherein the coating (3) comprises at least one constituent (7) containing silicon or aluminum and oxygen.

8. Catalyst support body (1) according to any one of claims 4 to 10, wherein the catalyst support body (1) is constructed using metallic material.

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9. Catalyst support body (1) according to any one of the preceding claims, wherein the catalyst support body (1) comprises a multi-walled sheet structure (8) with at least one channel (9) through which a fluid is able to flow.

15 10. Catalyst support body (1) according to claim 8 or 9, wherein the catalyst support body (1) comprises a plurality of plates (10) and the latter form openings (11) through which a fluid is able to flow.

11. Catalyst support body (1) according to any one of claims 1 to 7, wherein
20 the catalyst support body (1) is constructed using ceramic material.

12. Reactor (25) for the preparation of polymerisable monomers having at least one reaction chamber (12) through which a fluid is able to flow, the at least one reaction chamber (12) comprising at least one catalyst support body (1) in accordance with any one of the preceding claims.

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13. Process for the production of a coating (3) on a surface (2) of a catalyst support body (1), which comprises at least the following steps:

- preparation of a solid/fluid phase with a catalyst suitable for the preparation of an organic molecule containing at least one double bond and oxygen,
- 10 - application of the solid/fluid phase to a catalyst support body (1),
- formation of a coating (3) having fissures (4) having a length (5), the total fissure length being at least 500 m/m² [meters per square meter], the catalyst support body (1) being subjected to adhesion-enhancing treatment prior to the application of the solid/fluid phase.

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14. Process according to claim 13, wherein prior to the application of the solid/fluid phase the catalyst support body (1) is subjected to adhesion-enhancing treatment.

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15. Process according to claim 14, wherein at least one of the following steps is carried out, especially in respect of catalyst support bodies (1) of metallic material:

- a) abrasive blasting of the surface (2);
- b) machining of the surface (2);
- c) cleaning of the surface (2);
- 25 d) thermal treatment of the surface (2).

16. Process according to any one of claims 13 to 15, wherein application of the solid/fluid phase is effected at least in accordance with one of the following steps: spray-application, spreading, pouring, immersion.

5 17. Process according to any one of claims 13 to 16, wherein the catalyst support body (1) is dried after application of the solid/fluid phase.

18. Process according to any one of claims 13 to 17, wherein the coating (3) is formed by calcining.

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19. Process according to any one of claims 13 to 18, wherein the applied coating (3) is brought into contact with at least one further solid/fluid phase for impregnation of catalytically active materials.

15 20. Process according to claim 19, wherein the impregnated coating (3) is subjected to a thermal treatment.

21. Process according to any one of claims 13 to 20, wherein the applied coating (3) is reduced.

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22. Process according to any one of claims 13 to 21, wherein the catalyst support body (1) is at least partially elastically deformed, so that fissures (4) are formed in the coating (3).

23. Process for the preparation of an organic molecule containing at least one double bond and oxygen, in which process an organic molecule containing at least one double bond is brought into contact with oxygen in the presence of a catalyst support body (1) according to any one of claims 1 to 11.

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24. Process for the preparation of an organic molecule containing at least one double bond and oxygen, in which process an organic molecule containing at least one double bond is brought into contact with oxygen in at least one reactor (25) according to claim 12.

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